~~What is claimed is:~~CLAIMS

1. Use of a modified human cystathionine-γ-lyase (CGL) enzyme in the manufacture of a medicament for ~~A method of~~ treating a subject having or at risk of developing homocystinuria or hyperhomocysteinemia, ~~the method comprising:~~

~~administering a therapeutically effective amount of~~ wherein the ~~formulation comprising a~~ modified human cystathionine-γ-lyase (CGL) enzyme compris~~es~~~~ing~~ at least the following substitutions relative to a native human CGL amino acid sequence (SEQ ID NO: 1): isoleucine at position 59, leucine at position 63, methionine at position 91, aspartic acid at position 119, arginine at position 268, glycine at position 311, valine at position 339, and serine at position 353;

wherein the ~~formulation~~medicament is administered at an enzyme dose of about 0.05 mg/kg to about 4 mg/kg at a frequency of one dose per day to one dose per month.

2. The ~~method~~use of claim 1, wherein the enzyme is bound to one or more PEG units.

3. The ~~method~~use of claim 1 or 2, wherein the ~~formulation~~medicament further comprises a pharmaceutically acceptable carrier.

4. The ~~method~~use of any one of claims 1-3, wherein the ~~formulation~~medicament is 2 mL of a liquid supplied in a 5 mL vial.

5. The ~~method~~use of any one of claims 1-4, wherein the ~~formulation~~medicament comprises an enzyme concentration of about 1 mg/mL to about 50 mg/mL.

6. The ~~method~~use of any one of claims 1-5, wherein the ~~formulation~~medicament comprises an enzyme concentration of about 1 mg/mL to about 20 mg/mL.

7. The ~~method~~use of any one of claims 1-6, wherein the ~~formulation~~medicament is administered intravenously or subcutaneously.

8. The ~~method~~use of any one of claims 1-7, wherein the ~~formulation~~medicament is administered one dose per week.

9. The ~~method~~use of any one of claims 1-8, wherein the ~~formulation~~medicament is administered intravenously for four weeks, followed by subcutaneous administration in subsequent weeks.

10. The ~~method~~use of any one of claims 1-9, wherein the ~~formulation~~medicament is administered to the subject at a dose of about 0.1 mg/kg to about 1 mg/kg.

11. The ~~method~~use of any one of claims 1-10, wherein the ~~formulation~~medicament is administered once a week at a dose of about 0.1 mg/kg to about 1 mg/kg.

12. The ~~method~~use of any one of claims 1-11, wherein the ~~formulation~~medicament is administered to the subject at a dose of about 0.15 mg/kg, about 0.45 mg/kg, or about 1 mg/kg.

13. The ~~method~~use of any one of claims 1-12, wherein the ~~formulation~~medicament is diluted in saline prior to intravenously administering to the subject.

14. The ~~method~~use of any one of claims 1-13, wherein the subject is a human patient.

15. The ~~method~~use of any one of claims 1-14, wherein the subject has a total plasma homocysteine level greater than 80 μM prior to initiating therapy with administering the ~~formulation~~medicament.

16. The ~~method~~use of any one of claims 1-15, wherein the subject is at least 12 years of age.

17. The ~~method~~use of any one of claims 1-16, wherein the subject is maintained on an individualized diet.

18. The ~~method~~use of any one of claims 1-17, wherein the subject is maintained on a methionine-restricted diet.

19. The ~~method~~use of any one of claims 1-18, wherein the ~~method~~use reduces total plasma homocysteine levels.

20. The ~~method~~use of any one of claims 1-19, wherein the ~~method~~use reduces total plasma homocysteine levels to less than or equal to about 80 μM.

21. The ~~method~~use of any one of claims 1-20, wherein the ~~method~~use reduces total plasma homocysteine levels to less than or equal to about 50 μM.

22. The ~~method~~use~~s~~ of any one of claims 1-21, wherein the ~~method~~use reduces total plasma homocysteine levels to less than or equal to about 15 μM.